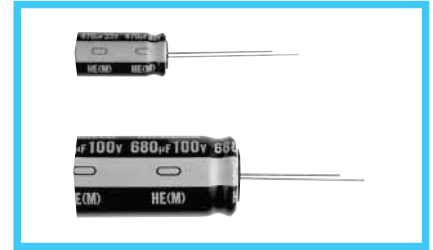
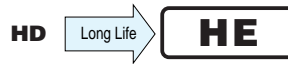


HE series
Miniature Sized, Low Impedance, High Reliability



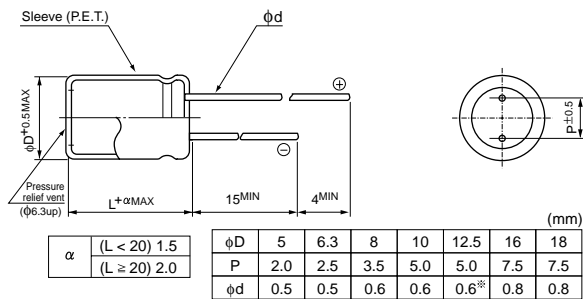
- Low impedance and high reliability withstanding 4000hours to 10000hours.



Specifications

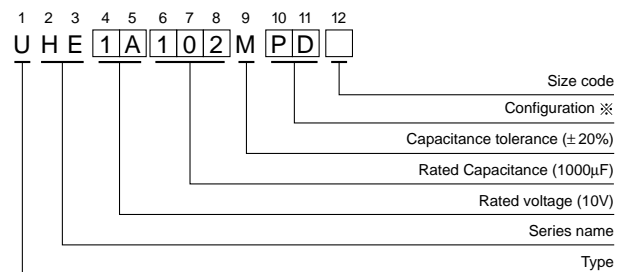
Item	Performance Characteristics										
Category Temperature Range	-40 ~ +105°C										
Rated Voltage Range	6.3 ~ 100V										
Rated Capacitance Range	6.8 ~ 18000μF										
Capacitance Tolerance	±20% at 120Hz, 20°C										
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA), whichever is greater.										
tan δ	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz 20°C	
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08		
For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.											
Stability at Low Temperature	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz	
	Impedance ratio	Z-25°C / Z+20°C	4	3	2	2	2	2	2		2
		ZT / Z20 (MAX.)	Z-40°C / Z+20°C	8	6	4	3	3	3	3	
Endurance	After an application of D.C. bias voltage plus the rated ripple current for stated in the below at 105°C the peak voltage shall not exceed the rated D.C. voltage, capacitors shall meet the following requirements.										
	Case size		φD ≤ 6.3	φD = 8, 10	φD ≥ 12.5						
	Rated voltage (V)	6.3 ~ 10WV	4000hours	6000hours	8000hours						
		16 ~ 100WV	5000hours	7000hours	10000hours						
	Capacitance change	Within ±25% of initial value									
	tan δ	200% or less of initial specified value									
Leakage current	Initial specified value or less										
Marking	Printed with white color letter on black sleeve.										

Radial Lead Type



*In case L > 25 for the φ12.5 dia. unit, lead dia. φd = 0.8mm

Type numbering system (Example : 10V 1000μF)



※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve	Sn-Pb finished leadwire PVC sleeve (containing Pb)
5	DD	DH
6.3	ED	EH
8 · 10	PD	PH
12.5 - 18	HD	HH

※ Please contact to us if other configurations are required.

Frequency coefficient of rated ripple current

Cap. (μF)	Frequency	50Hz	120Hz	300Hz	1kHz	10kHz~
6.8 ~ 33		0.45	0.55	0.70	0.90	1.00
39 ~ 330		0.60	0.70	0.85	0.95	1.00
390 ~ 1000		0.65	0.75	0.90	0.98	1.00
1200 ~ 18000		0.75	0.80	0.95	1.00	1.00

Please refer to page 19, 20, 21 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.

• Dimension table in next page.

Standard ratings

V (Code)		6.3 (0J)				10 (1A)			
Cap.(μ F)	Code	Item Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
100	101					5 \times 11	0.58	2.3	210
150	151	5 \times 11	0.58	2.3	210				
220	221					6.3 \times 11	0.22	0.87	340
330	331	6.3 \times 11	0.22	0.87	340				
470	471					8 \times 11.5	0.13	0.52	640
680	681	8 \times 11.5	0.13	0.52	640	8 \times 15	0.087	0.35	840
						▲ 10 \times 12.5	0.080	0.32	865
820	821	10 \times 12.5	0.080	0.32	865				
1000	102	8 \times 15	0.087	0.35	840	8 \times 20	0.069	0.27	1050
						▲ 10 \times 16	0.060	0.24	1210
1200	122	8 \times 20	0.069	0.27	1050	10 \times 20	0.046	0.18	1400
		▲ 10 \times 16	0.060	0.24	1210				
1500	152	10 \times 20	0.046	0.18	1400	10 \times 25	0.042	0.17	1650
1800	182	12.5 \times 15	0.049	0.16	1450	▲ 12.5 \times 15	0.049	0.16	1450
2200	222	10 \times 25	0.042	0.17	1650	10 \times 31.5	0.031	0.12	1910
						▲ 12.5 \times 20	0.035	0.12	1900
						● 16 \times 15	0.042	0.12	1940
2700	272	▲ 10 \times 31.5	0.031	0.12	1910	18 \times 15	0.043	0.11	2210
		16 \times 15	0.042	0.12	1940				
3300	332	12.5 \times 20	0.035	0.12	1900	12.5 \times 25	0.027	0.089	2230
3900	392	12.5 \times 25	0.027	0.089	2230	12.5 \times 31.5	0.024	0.078	2650
		▲ 18 \times 15	0.043	0.11	2210	▲ 16 \times 20	0.027	0.078	2530
4700	472	12.5 \times 31.5	0.024	0.078	2650	12.5 \times 35.5	0.020	0.065	2880
5600	562	12.5 \times 35.5	0.020	0.065	2880	12.5 \times 40	0.017	0.056	3350
		▲ 16 \times 20	0.027	0.078	2530	▲ 16 \times 25	0.021	0.060	2930
						● 18 \times 20	0.026	0.067	2860
6800	682	12.5 \times 40	0.017	0.056	3350	16 \times 31.5	0.017	0.050	3450
		▲ 16 \times 25	0.021	0.060	2930				
		● 18 \times 20	0.026	0.067	2860				
8200	822	16 \times 31.5	0.017	0.050	3450	16 \times 35.5	0.015	0.044	3610
						▲ 18 \times 31.5	0.015	0.040	4170
10000	103	16 \times 35.5	0.015	0.044	3610	16 \times 40	0.013	0.038	4080
		▲ 18 \times 25	0.019	0.049	3140	▲ 18 \times 35.5	0.014	0.038	4220
12000	123	16 \times 40	0.013	0.038	4080	18 \times 40	0.012	0.032	4280
		▲ 18 \times 31.5	0.015	0.040	4170				
15000	153	18 \times 35.5	0.014	0.038	4220				
18000	183	18 \times 40	0.012	0.032	4280				

▲: In this case, [6] will be put 12th digit type numbering system.
 ●: In this case, [3] will be put 12th digit type numbering system.

Standard ratings

V (Code) Item Cap.(μF) Code		16 (1C)				25 (1E)			
		Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
47	470					5 × 11	0.58	2.3	210
56	560	5 × 11	0.58	2.3	210				
100	101					6.3 × 11	0.22	0.87	340
120	121	6.3 × 11	0.22	0.87	340				
220	221					8 × 11.5	0.13	0.52	640
330	331	8 × 11.5	0.13	0.52	640	8 × 15	0.087	0.35	840
						▲ 10 × 12.5	0.080	0.32	865
470	471	8 × 15 ▲ 10 × 12.5	0.087 0.080	0.35 0.32	840 865	8 × 20	0.069	0.27	1050
						▲ 10 × 16	0.06	0.24	1210
680	681	8 × 20 ▲ 10 × 16	0.069 0.060	0.27 0.24	1050 1210	10 × 20	0.046	0.18	1400
						▲ 12.5 × 15	0.049	0.16	1450
820	821					10 × 25	0.042	0.17	1650
1000	102	10 × 20	0.046	0.18	1400	10 × 31.5	0.031	0.12	1910
		▲ 12.5 × 15	0.049	0.16	1450	▲ 12.5 × 20	0.035	0.12	1900
						● 16 × 15	0.042	0.12	1940
1200	122	10 × 25	0.042	0.17	1650	18 × 15	0.043	0.11	2210
1500	152	10 × 31.5	0.031	0.12	1910	12.5 × 25	0.027	0.089	2230
		▲ 12.5 × 20	0.035	0.12	1900				
		● 16 × 15	0.042	0.12	1940				
1800	182					12.5 × 31.5	0.024	0.078	2650
						▲ 16 × 20	0.027	0.078	2530
2200	222	12.5 × 25	0.027	0.089	2230	12.5 × 35.5	0.020	0.065	2880
		▲ 18 × 15	0.043	0.11	2210	▲ 18 × 20	0.026	0.067	2860
2700	272	12.5 × 31.5	0.024	0.078	2650	12.5 × 40	0.017	0.056	3350
		▲ 16 × 20	0.027	0.078	2530	▲ 16 × 25	0.021	0.060	2930
3300	332	12.5 × 35.5	0.020	0.065	2880	16 × 31.5	0.017	0.050	3450
						▲ 18 × 25	0.019	0.049	3140
3900	392	12.5 × 40	0.017	0.056	3350	16 × 35.5	0.015	0.044	3610
		▲ 16 × 25	0.021	0.060	2930				
		● 16 × 20	0.026	0.067	2860				
4700	472	16 × 31.5	0.017	0.050	3450	16 × 40	0.013	0.038	4080
		▲ 18 × 25	0.019	0.049	3140	▲ 18 × 35.5	0.014	0.038	4220
5600	562	16 × 35.5	0.015	0.044	3610	18 × 40	0.012	0.032	4280
		▲ 18 × 31.5	0.015	0.040	4170				
6800	682	16 × 40	0.013	0.038	4080				
8200	822	18 × 35.5	0.014	0.038	4220				
10000	103	18 × 40	0.012	0.032	4280				

▲: In this case, [6] will be put 12th digit type numbering system.
●: In this case, [3] will be put 12th digit type numbering system.

Standard ratings

V (Code)		35 (1V)				50 (1H)			
Cap.(μ F)	Code	Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
22	220					5 \times 11	0.70	2.8	180
33	330	5 \times 11	0.58	2.3	210				
47	470								
56	560	6.3 \times 11	0.22	0.87	340	6.3 \times 11	0.30	1.2	295
100	101					8 \times 11.5	0.17	0.68	555
120	121					8 \times 15	0.12	0.48	730
150	151	8 \times 11.5	0.13	0.52	640	10 \times 12.5	0.12	0.48	760
180	181					8 \times 20	0.091	0.36	910
220	221	8 \times 15	0.087	0.35	840	10 \times 16	0.084	0.34	1050
		▲10 \times 12.5	0.080	0.32	865				
270	271	8 \times 20	0.069	0.27	1050	10 \times 20	0.060	0.24	1220
						▲12.5 \times 15	0.061	0.20	1260
330	331	10 \times 16	0.060	0.24	1210	10 \times 25	0.055	0.22	1440
470	471	10 \times 20	0.046	0.18	1400	10 \times 31.5	0.043	0.17	1690
		▲12.5 \times 15	0.049	0.16	1450	▲12.5 \times 20	0.045	0.15	1660
						● 16 \times 15	0.055	0.17	1690
560	561	10 \times 25	0.042	0.17	1650	12.5 \times 25	0.034	0.11	1950
						▲ 18 \times 15	0.054	0.15	1930
680	681	10 \times 31.5	0.031	0.12	1910	12.5 \times 31.5	0.030	0.10	2310
		▲12.5 \times 20	0.035	0.12	1900				
		● 16 \times 15	0.042	0.12	1940				
820	821					12.5 \times 35.5	0.025	0.083	2510
						▲16 \times 20	0.034	0.10	2210
1000	102	12.5 \times 25	0.027	0.089	2230	12.5 \times 40	0.021	0.069	2920
		▲18 \times 15	0.043	0.11	2210	▲16 \times 25	0.025	0.075	2555
						●18 \times 20	0.036	0.097	2490
1200	122	12.5 \times 31.5	0.024	0.078	2650	16 \times 31.5	0.022	0.066	3010
		▲16 \times 20	0.027	0.078	2530	▲18 \times 25	0.026	0.070	2740
1500	152	12.5 \times 35.5	0.020	0.065	2880	16 \times 35.5	0.019	0.057	3150
1800	182	12.5 \times 40	0.017	0.056	3350	16 \times 40	0.016	0.048	3710
		▲16 \times 25	0.021	0.060	2930				
		●18 \times 20	0.026	0.067	2860				
2200	222	16 \times 31.5	0.017	0.050	3450	▲18 \times 35.5	0.017	0.046	3680
		▲ 18 \times 25	0.019	0.049	3140				
2700	272	16 \times 35.5	0.015	0.044	3610	18 \times 40	0.014	0.038	3800
		▲18 \times 31.5	0.015	0.040	4170				
3300	332	16 \times 40	0.013	0.038	4080				
		▲18 \times 35.5	0.014	0.038	4220				
3900	392	18 \times 40	0.012	0.032	4280				

▲: In this case, [6] will be put 12th digit type numbering system.

●: In this case, [3] will be put 12th digit type numbering system.

■ Standard ratings

V (Code) Item Cap.(μ F) Code		63 (1J)				100 (2A)			
		Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size ϕ D \times L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
6.8	6R8					5 \times 11	2.3	9.3	62
15	150	5 \times 11	2.3	9.3	62	6.3 \times 11	1.2	5.0	126
27	270					8 \times 11.5	0.63	2.8	260
33	330	6.3 \times 11	1.2	5.0	126				
39	390					8 \times 15	0.45	2.1	335
47	470					10 \times 12.5	0.43	1.8	325
56	560	8 \times 11.5	0.63	2.8	260	8 \times 20	0.33	1.6	408
68	680					10 \times 16	0.31	1.5	400
82	820	8 \times 15	0.45	2.1	335	10 \times 20	0.21	0.94	518
		▲10 \times 12.5	0.43	1.8	325	▲12.5 \times 15	0.23	1.1	527
100	101					10 \times 25	0.20	0.84	595
120	121	8 \times 20	0.33	1.6	408	10 \times 31.5	0.15	0.71	740
		▲10 \times 16	0.31	1.5	400	▲12.5 \times 20	0.16	0.64	765
150	151					16 \times 15	0.14	0.66	895
180	181	10 \times 20	0.21	0.94	518	12.5 \times 25	0.12	0.45	875
		▲12.5 \times 15	0.23	1.1	527	▲18 \times 15	0.12	0.50	1030
220	221	10 \times 25	0.20	0.84	595	12.5 \times 31.5	0.10	0.42	1010
						▲16 \times 20	0.091	0.38	1130
270	271	10 \times 31.5	0.15	0.71	740	12.5 \times 35.5	0.083	0.35	1140
		▲12.5 \times 20	0.16	0.64	765				
		● 16 \times 15	0.14	0.66	895	▲16 \times 25	0.073	0.27	1350
330	331	12.5 \times 25	0.12	0.45	875	12.5 \times 40	0.071	0.30	1280
						▲18 \times 20	0.080	0.30	1300
390	391	18 \times 15	0.12	0.50	1030	16 \times 31.5	0.054	0.20	1650
						▲18 \times 25	0.057	0.21	1560
470	471	12.5 \times 31.5	0.10	0.42	1010	16 \times 35.5	0.045	0.17	1900
		▲16 \times 20	0.091	0.38	1130	▲18 \times 31.5	0.047	0.17	1720
560	561	12.5 \times 35.5	0.083	0.35	1140	16 \times 40	0.040	0.15	2130
		▲16 \times 25	0.073	0.27	1350				
680	681	12.5 \times 40	0.071	0.30	1280	18 \times 35.5	0.040	0.15	1890
		▲18 \times 20	0.080	0.30	1300				
820	821	16 \times 31.5	0.054	0.20	1650	18 \times 40	0.036	0.13	2470
		▲18 \times 25	0.057	0.21	1560				
1000	102	16 \times 35.5	0.045	0.17	1900				
		▲18 \times 31.5	0.047	0.17	1720				
1200	122	16 \times 40	0.040	0.15	2130				
		▲18 \times 35.5	0.040	0.15	1890				
1500	152	18 \times 40	0.036	0.13	2470				

▲ : In this case, 6 will be put 12th digit type numbering system.● : In this case, 3 will be put 12th digit type numbering system.